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ACACIA MEDIA TECHNOLOGIES CORPORATION

UNITED STATES DISTRICT COURT

DISTRICT OF CALIFORNIA

SOUTHERN DIVISION

ACACIA MEDIA TECHNOLOGIES CORPORATION, Plaintiff, vs. NEW DESTINY INTERNET GROUP, INC., et al. Defendants. AND ALL RELATED CASE ACTIONS.	Case No. SA CV 02-1040 JW (MLGx) **Consolidated Cases:** SA CV 02-1048 JW (MLGx) SA CV 02-1063 JW (MLGx) SA CV 02-1165 JW (MLGx) SA CV 03-0218 JW (MLGx) SA CV 03-0219 JW (MLGx) SA CV 03-0259 JW (MLGx) SA CV 03-0271 JW (MLGx) SA CV 03-0308 JW (MLGx) **Related Cases:** SA CV 03-1801 JW (MLGx) SA CV 03-1803 JW (MLGx) SA CV 03-1804 JW (MLGx) SA CV 03-1807 JW (MLGx) **DECLARATION OF S. MERRILL WEISS IN SUPPORT OF ACACIA'S OPPOSITION TO MOTION FOR SUMMARY JUDGMENT** Hearing Date: December 2, 2004 Hearing Time: 9:00 a.m. Courtroom: 9C, 9th Floor Honorable James Ware

Dockets.Justia.com

I. INTRODUCTION

1. I, S. Merrill Weiss, am a citizen of the United States and reside in Edison, New Jersey.

2. I have been retained by counsel for plaintiffs, Acacia Media Technologies Corporation, as a testifying expert to study and provide consultation, testimony, and opinions regarding the patent infringement litigation with respect to U.S. Patent Number 6,144,702 (the '702 patent), as described in this report. Specifically, I have been retained to testify on the topics of television as it was practiced in the United States in January, 1991, of television standards, their development, and their interpretation, and of the development of electronics and computer technology leading up to and around the date of original submission of the patent. This may include: my interpretation and understanding of the patent at issue; the common knowledge available to one of ordinary skill in the art of the patent in January, 1991; my interpretation and understanding of industry standards; and my opinions about issues regarding "sequence encoder" and "identification encoder" and enablement issues regarding "identification encoder."

II. CREDENTIALS

3. I am a consultant in electronic media technology, technology management, and management, serving clients in the United States, Canada, Japan, Europe and the Middle East. These clients have included broadcast television networks, broadcast television stations, cable and satellite programming networks, cable, wireless cable, and satellite television system operators, research laboratories, Hollywood studios, broadcast and television equipment manufacturing companies, common carriers of television and other broadcast signals, investment bankers, as well as industry associations representing these various entities. During the course of my consulting work, I am in routine contact with employees of the entities discussed above, including those employees having programming and engineering responsibilities.

4. I have over thirty-seven years experience in broadcasting and related fields, with over twenty-seven years in management and consulting. My experience includes over thirty-six years designing, building, and managing new technical facilities for various electronic media clients. From 1985-1991, I was employed by the National Broadcasting Company (NBC) as Managing Director of Systems Engineering and as Managing Director of Advanced Television Systems.

5. For over twenty-seven years, I have worked on the development of new television technologies and the writing of standards for them, including analog video, digital video, component video, digital control, digital video compression, and all the associated data and metadata functionality. I conducted the experiments that led to the very first digital television standard (CCIR Recommendation 601) in 1981. That standard is the standard upon which most subsequent digital television standards draw, including the widely used MPEG-2 digital video compression standard. Since that time, I have been involved in the development of most of the digital television standards and many other related standards. I am currently involved in the development of enhanced and interactive television and other technologies that depend upon the convergence of television, computing, and data communications.

6. I have served as the chairman of one or another of the technology committees of the Society of Motion Picture and Television Engineers (SMPTE) continuously for over twenty-two years. In the recent past, I served four years as the SMPTE Engineering Director for Television, chairing its TV Steering Committee. In that role, I was responsible for managing the worldwide development of standards for television along with a wide range of other technologies. I served as co-chairman, with a European counterpart, of the joint SMPTE/European Broadcasting Union (EBU) Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams. I was the initiator, author, and final editor of the only adopted technical standard written for the NTSC color television system (SMPTE 170M). I was nominated for a technical Emmy Award for my work on serial digital interfaces

for television systems. Subsequent to my service as SMPTE Engineering Director for Television, I chaired the SMPTE Committee on Systems Technology (S22), having responsibility, among other things, for standards for time code, in particular SMPTE 12M. I currently serve as chairman of the SMPTE Committee on Registration and Identification Technology (R30), having responsibility for development of standards for identification of program content and for SMPTE registration activities. I participate in the work of the relevant body of the International Standards Organization (ISO) as a liaison from SMPTE on the subject of content registration and identification.

7. I significantly contributed to the work of the FCC Advisory Committee on Advanced Television Service (ACATS). I participated extensively on implementation matters and in both the technical and economic analyses of the various system proposals, including the digital systems that were the progenitors of MPEG-2. I currently participate in a wide range of the Advanced Television Systems Committee's (ATSC) efforts to guide the implementation of Digital Television (DTV). Within ATSC, I have been responsible for development of standards on Directed Channel Change (DCC) and Distributed Transmission – a form of Single Frequency Network (SFN) – and a variety of other technologies.

8. I am a member of the Society of Cable Telecommunications Engineers (SCTE) and have participated in the standards development work of its Digital Video Subcommittee (DVS). The SCTE DVS develops standards for digital television signals on cable networks, cable set top boxes, and cable-ready television receivers. In that body, I have served both to represent the interests of my clients and as a liaison to the SMPTE and the ATSC.

9. I have presented or published well over one hundred technical papers on diverse television and related technologies. I have also published books regarding advanced television technology. I have been recognized by the Society of Motion Picture and Television Engineers by elevation to the rank of Fellow (in 1987), and

was the 1995 recipient of its David Sarnoff Gold Medal Award. I hold one issued U.S. patent with an application for a second U.S. and international patent pending. Additionally, the Society of Broadcast Engineers (SBE) recognizes me as a Certified Professional Broadcast Engineer.

10. I have a Bachelors of Business Administration degree from the Wharton School of the University of Pennsylvania. I am self-taught in electronics technology, but, during one period in the late 1980's, I had 36 degreed engineers working for me during my employment by NBC, throughout which time I served as the ultimate problem solver for technical problems that the engineers in my employ were unable to resolve by themselves.

11. For a significant part of my career, I was employed to design systems for broadcast facilities, sometimes including special-purpose hardware and software to provide functions not available except through custom design and construction. When at NBC, I served as the ultimate technical authority with respect decisions on choices of technology. While I worked for Westinghouse Broadcasting Company prior to NBC, I participated in the development and installation of computerized automation systems at KYW Television in Philadelphia and KPIX in San Francisco. I designed and built new studio facilities for KPIX from the ground up and was responsible for the selection and installation there of the first central lending library still store system worldwide.

12. A complete copy of my current curriculum vitae, which summarizes my qualifications and professional experience is attached as Exhibit B hereto. My curriculum vitae includes a list of my publications.

Compensation

13. I am being compensated for my work in this case at my customary rate of $350 per hour, plus expenses. In the event I am called to testify, my compensation rate is $400 per hour. My compensation is not based on the outcome of the litigation.

Prior Testimony

14. Within the last four (4) years, I have not testified as an expert witness at trial. I have testified by deposition in the case of *Superguide Corporation vs. DirecTV Enterprises vs. Gemstar Development Corporation*, Civil Action No. 1:00 CV 144-T, United States District Court for the Western District of North Carolina, Asheville Division; in the case of *Parental Guide of Texas, Inc. vs. Funai Corporation, Inc., et al*, Civil Action No.: 2:00 CV 262, United States District Court for the Eastern District of Texas, Marshall Division; and in the case of *Zenith Electronics Corporation v. WH-TV Broadcasting Corporation* and *WH-TV Broadcasting Corporation v. Zenith Electronics Corporation, Motorola, Inc. and General Instrument Corporation*, Civil Action No. 01C 4366, United States District Court for the Northern District of Illinois, Eastern Division.

III. OVERVIEW OF PATENT AT ISSUE

15. The patent at issue in this case is U.S. Patent Number 6,144,702, Audio and Video Transmission and Receiving System, to Paul Yurt and H. Lee Brown. It describes a system that, in one aspect, supports a service called "Video-On-Demand" (VOD), in which users are able to request programs they wish to watch or to which they wish to listen. The system uses video and audio compression to make the data representing the programs stored on the system occupy less storage space on the system and to permit faster transfer of the data from the system to the receiving devices used by consumers to view and/or listen to the content.

16. The system of the patent is built on the technology of television system automation, using computer databases, process control applications, and operations timed to the inherent cadence of video and audio signals as well as to real world time ("wall clock" time). The system described can store at the point of consumption the data transferred from the central repository for the content. That storage at the point of consumption (buffering) allows viewing or listening at times other than that at which the content is delivered and permits transfers both faster and slower than real time to

take advantage of the capabilities of a variety of delivery media available for the purpose. The patent teaches how to create VOD and other sorts of delivery applications across the variety of delivery media including broadcast channels, cable television networks and systems, satellite services, and the Internet. The use of these technologies leads directly to the characteristics that would be possessed by one of ordinary skill in the art as described in the next section.

IV. ONE OF ORDINARY SKILL IN THE ART

17. I have been asked to give my opinion as to the educational and vocational qualifications of one of ordinary skill in the subject matter taught by the patent at the time of the invention, which is January, 1991.

18. In January, 1991, a hypothetical person of ordinary skill in the art to whom this patent is addressed would have a range of knowledge roughly equivalent to that of a person holding a degree of Bachelor of Science in Electrical Engineering, Computer Science, or Computer Engineering with experience in systems design in the broadcast industry. An actual engineering degree or a higher degree than a Bachelor's degree would not be necessary since none of the patent subject matter is at a high theoretical level; rather, it reflects engineering systems design and implementation practice. This person would have at least three years of experience in designing systems that distributed digital content and, from an engineering perspective, would be knowledgeable about over-the-air broadcast, cable, and satellite distribution and broadcast systems. As a systems designer and team leader, this hypothetical person would be capable of directing tasks in hardware engineering, computer architecture, and software engineering. In reaching this opinion as to the qualifications of the hypothetical person of ordinary skill in the art, I have considered the types of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field.

I discussed my opinion regarding the person of ordinary skill in the art in a telephone call with Peter Alexander on Tuesday, October 19, 2004 at approximately 5:00 p.m. Pacific time. Peter and I were in agreement regarding the qualifications of a person of ordinary skill in the art, and we discussed, and ultimately agreed upon, the specific qualifications that are described above.

V. DESIGN PROCESS

20. Before beginning a general discussion of the questions that I have been asked to address, it will be helpful first to consider briefly the conventional processes involved in the design of hardware and software. This will provide a foundation for the discussions to follow by making clear that there are many decisions to be made in the system design process that relate to the purposes of a system and its basic characteristics without being dependent upon the technology of a patent that might be implemented as part of the design. Thus, those choices can be made without involving the level of experimentation that render a patent insufficiently enabling.

A. For Hardware

21. When considering the design of hardware, there are several aspects of the system design that must be specified first to enable the more detailed design of the particular hardware. Among the initial choices to be identified are the functions to be performed by each element or device within the system or piece of equipment, the interconnection protocols to be used to connect elements of the system or device together, and any physical constraints on the hardware unit.

22. The functional specifications will include the types of signals or information to be communicated to the device on its input(s), the types of signals or information to be communicated by the device on its output(s), and the types of manipulations to be carried out on the signals or information in the process contained within the device.

23. Interconnection protocols include the voltage levels of the signals on the input(s) and output(s) of the device, the frequency ranges and forms of modulation

plus the interface and connector types to be used. Also included may be the standards to be used to define the interfaces, the order in which signals are exchanged between devices, and the like.

24. Physical constraints include such factors as the space available for the hardware items, the power available, and limitations on the heat that can be generated by the equipment, mounting arrangements for the gear, locations in which it will be placed, and similar considerations.

25. Making choices of the sort described would be considered part of the system design process and would not constitute experimentation in the sense that the third question to which I was asked to respond would contemplate experimentation. Making choices of this sort can follow an iterative process as the system design is refined, but that, again, does not constitute experimentation with respect to the patented technology.

B. For Software

26. When considering the design of software, there also are several aspects of the system design that must be specified first to enable the more detailed design of the particular software. Among the initial choices to be identified are the functions to be performed by the overall software structure, the software interface protocols to be used to exchange data between the software and other system elements, and any limitations on the operation of the software.

27. The functional specifications will include the structure of the data and the types of data to be communicated to the software at its input, the structure of the data and the types of data to be communicated by the software at its output, and the types of manipulations of the data to be performed in the algorithms to be executed by the software.

28. The software interface protocols specify such characteristics as the format and packaging of the data exchanged by the software with other system elements, the control functions (handshaking) executed by the software to enable

exchange of the data with other system elements, the paths to be followed by the data in moving from one part of the system to another, and the like. Standard software interfaces available in the industry and ones designed specifically for the system (such as application programming interfaces – APIs) are often specified.

29. Limitations on the operation of the software might include time constraints on the delivery of output data following receipt of input data, constraints on the amount of memory that can be used for different functions, constraints on the load placed on the hardware on which the software will run, and the like.

30. As in the hardware case, making choices of the sort described would be considered part of the system design process and would not constitute experimentation in the sense that the third question to which I was asked to respond would contemplate experimentation. Making choices of this sort can follow an iterative process as the system design is refined, but that, again, does not constitute experimentation with respect to the patented technology

VI. QUESTIONS TO BE ADDRESSED

31. There are three questions that I have been asked to address: (1) Would one of ordinary skill in the art understand what is meant by "Identification Encoder" when reading the claims in light of the specification in January, 1991, and, if so, what was the meaning of "Identification Encoder" to one of ordinary skill in the art at that time? (2) Would one of ordinary skill in the art understand what is meant by "Sequence Encoder" when reading the claims in light of the specification in January, 1991, and, if so, what was the meaning of "Sequence Encoder" to one of ordinary skill in the art at that time? And (3) Could one of ordinary skill in the art, using his knowledge and the description in the patent under consideration, in January, 1991, make and use the inventions in the '702 patent without undue experimentation? Before considering the questions themselves, it will be useful to set out the process to be followed in answering the questions so that it will not have to be described with respect to each answer.

A. Analysis Process

32. To determine what one of ordinary skill in the art would have understood, in early 1991, as the meaning of the two terms in question, it helps me to imagine what I would have done at that time if given the patent by my boss and asked to build the system described in one of the claims. In fact, I can directly relate to what one of ordinary skill in the art would have understood then since, at that time, I had spent the preceding 23 years designing hardware, software, and systems for radio and television facilities in exactly the areas of expertise required, as described previously, and managing the work of others in those endeavors.

33. Since the two terms in question both involve an "encoder," a good place to start would be with the meaning of the term "encoder." Then, I could look for instances of the term in the specification and the claims to see what types of encoders were implicated with each use of the word. For those instances that relate to other forms of encoder, I could eliminate them from consideration while focusing on the remaining instances to see which form of encoder they were and what information they provided about that form. This process of elimination would allow determination of the meaning of each specific form of encoder to the extent possible.

34. Before starting through the process described, it is useful to recognize that many terms that appear in technical parlance (and in patents) are coined by designers (and inventors) to help them describe particular systems, subsystems, or circuits with which they are involved. Sometimes such terms catch on in the industry and achieve wide use, but, more often, they do not. Frequently, terms consist of compound phrases involving well-known terms put together in such a way that one of skill in the art can interpret them without difficulty even though a specific compound term might never achieve sufficient use to cause it to appear in a standard dictionary of terms.

35. An example of such compounding of terms might involve the base term "oscillator" (roughly, a device that produces a continuously alternating signal of one

sort or another).[1] To the term oscillator, many modifiers can be and have been applied to describe a wide variety of forms and functions of oscillators. For some examples: a variable frequency oscillator (VFO) is one whose output frequency is designed to be easily varied. A crystal oscillator is one whose operating frequency is controlled by a piezoelectric resonant element. A voltage-controlled oscillator (VCO) is one whose output frequency can be varied by a voltage used as a control input to the oscillator. A voltage-controlled crystal oscillator (VCXO) is one using a crystal for its fundamental frequency determination but allowing voltage control to modify the oscillator's frequency. An oven-controlled crystal oscillator (OCXO) is one whose output frequency is stabilized by controlling the temperature of the oscillator crystal and perhaps other components in an oven.

36. All of these oscillator forms and terms were in widespread use long before 1991, but only the oscillator, crystal oscillator, and voltage-controlled oscillator made it into the IEEE Standard Dictionary of Electrical and Electronics Terms by the time of its 1996 edition. Continuing the example, if someone were to have described in 1991 an optically-coupled, voltage-controlled crystal oscillator, it would have been apparent to one skilled in the art at that time that the term was describing a device that used optical coupling of the control voltage to a voltage controlled crystal oscillator to provide electrical isolation between the source of the control voltage and the oscillator. Such a term likely would never appear in a standard dictionary of terms, yet a practitioner of the art would immediately understand its structure and purpose. It is important to recognize that, beyond standard definitions and the material found in text books, journals, and the like, one of ordinary skill in an art also brings to bear his or her experience in practicing that art. Such an

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[1] A more formal definition, from the *IEEE Standard Dictionary of Electrical and Electronics Terms*, 1996 electronic edition, pertaining to electronics, is, "A nonrotating device for producing alternating current, the output frequency of which is determined by the characteristics of the device."

understanding requires consideration of what is "common knowledge" in addition to what has been documented.

B. Meaning Of "Encoder"

37. With this background established, let us now turn to the underlying term "encoder" and to the specific forms of encoder described in the '702 patent. To fully understand the term "encoder," we must work our way backward to the underlying terms "encode" and "code." First, an encoder is "a device or system that encodes data."[2] To "encode" means generally "to express a single character or a message in terms of a code" or specifically "to apply the rules of a code."[3] A "code" is "a character or bit pattern that is assigned a particular meaning."[4] (In each of these cases, I have selected a simple definition that seems most relevant to the current discussion. More complex and verbose definitions exist in the dictionary used, but none of them would add to understanding of the term in this context.)

38. So, one skilled in the art would have understood an encoder to be a device that applies a code of one sort or another to a set of data. The code is applied by following the rules of the code that establish the relationship between the underlying (input) data and the coded (output) data. One of the characteristics of most data coding is that encoded data can be decoded to obtain the original, underlying data to which the coding rules were first applied. Sometimes, the code itself can have meaning, subject to direct interpretation to recover the original information; in other cases, the code may have indirect meaning, and there may need to be reference to external data of one sort or another in order to recover the original information represented by the code. For example, if a code is used to represent the frequency to

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[2] From the IEEE Standard Dictionary of Electrical and Electronics Terms, 1996 electronic edition.

[3] *Id.*

[4] *Id.*

which a television receiver must be tuned to receive a particular program service, that channel number (the code) has a direct meaning in terms of the frequency to which the receiver must be tuned (the data). On the other hand, if a code represents a particular program carried at a particular time on a particular program service, then it may be necessary to consult a program guide or schedule listing to recover the information indicated by the code.

39. From the foregoing, one of ordinary skill in the art would have understood that an encoder (and its related decoder) has a set of characteristics that define it. Those characteristics include an input (e.g., the channel number), a function (e.g., converting between the channel number and the frequency to be tuned), and an output (e.g., the frequency information used by a receiver to tune to a desired channel). If one of ordinary skill in the art can determine those three elements for a particular encoder (i.e., the input, the function, and the output), he or she will know how a given encoder is supposed to work. With that information, one of ordinary skill in the art can set off to build one. Depending upon the type of encoding to be done, one of ordinary skill in the art may choose to implement the encoder in hardware or in software, as appropriate to the system he or she is building.

C. Uses Of "Encoder" In The '702 Patent

40. To focus on the appearances in the '702 patent of the specific encoder terms about which we are concerned, one of ordinary skill in the art would have started by locating all of the appearances of "encoder" and related terms (i.e., encode, encodes, encoded, encoding) for any purpose in the specification. It turns out that there are 55 of them (not counting those in the abstract and the claims). Of these, 20 are related to Identification Encoding and the Identification Encoder (112); another 10 are related to Storage Encoding, which is performed by the Identification Encoder; 16 are related to Time Encoding and the Time Encoder; and the remaining 9 are associated with miscellaneous encoding functions (television encoding – 1, compression encoding – 1, copy protection encoding – 1, encoding information – 1,

PCM data formatter encoding – 1, and transmission encoding – 4). With this breakdown, one skilled in the art could have segregated the characteristics of the encoding functions in question to see what they do and how they could be implemented. (It should be noted that some of the miscellaneous encoding functions are assigned to one of the principal encoders listed previously. We will examine them shortly.)

41. To help in appreciating the categorization of each of the occurrences in the specification of the term "encoder" or one of its relatives, Annex A to this report contains a copy of each section of the specification that uses one of the terms, together with a sequence number, a location reference in the patent, and a grouping into the categories into which each use of the term falls.

D. Meaning Of Identification Encoder

42. If one of ordinary skill in the art had examined the direct references to an Identification Encoder (and encoding) as well as to various functions ascribed to the Identification Encoder in the '702 patent, he or she would have learned a great deal about what an Identification Encoder is intended to be and do. Once knowing what the patent describes, he or she could have examined the various properties and applied to them what else would have been known about them at the time of the patent.

43. The following table lists the evident properties of an Identification Encoder as described in the '702 patent. Also included are indications of the aspects of the encoder (input / function / output) that each of the properties describes and a notation of the occurrence of the term in the patent that teaches us about the property.

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Property	Aspect	Occurrence
Retrieves information for items from a source material library	Input	1
Assigns unique identification code to retrieved information for storage in compressed form	Function	1, 3, 8, 12, 54, 55
Coupled to a conversion means	Output	2
Can encode both analog and digital items of information with unique identification codes but only needs to encode one type if that is all that is present in the system	Function	13, 14, 15, 16
Can send digital information to a digital input formatter	Output	17
Can send analog information (audio & video) to a pair of A-to-D converters (one each for audio & video)	Output	19, 20
Can encode copy protection information during the process of storage encoding	Function	6
Can perform storage encoding or enables storage encoding process	Function	7, 9,10, 11, 44, 45
Can log details about an item, including program notes, a popularity code, item notes, and production credits, as part of storage encoding process	Function	9, 10, 12, 41, 42, 48, 49
Can assign a file address, or unique address code, to an item	Function	12, 40
Can output previously compressed information (as from an inter-library transfer) directly to a compressed data formatter	Output	21
Can index songs by associated starting frame number during storage encoding	Function	32
Can make files addressable through assignment of the unique identification code	Function	39
Can map item addresses to item names to provide alternative method for accessing items	Function	43
Can access a master item database to track and describe items stored in one or more compressed data libraries	Function	46
Can update names and other facts in item database through storage encoding process	Function	47

44. To better understand the significance of the properties of an Identification Encoder listed in the table above, it is helpful to consider what is meant by unique identification codes to one of ordinary skill in the art, what was common knowledge about the sort of system described in the patent at the time of its first filing, and what might be some contemporaneous examples of other systems of the type described in the patent about which one of ordinary skill in the art would have been aware.

i. Unique Identification Codes

45. Persons skilled in the art in January, 1991 would have understood that a unique identification code is composed of two parts: a unique identifier and a coded representation of that identifier. When considering the unique identifier, there are two important aspects of which to be aware: the scope of uniqueness and the degree of uniqueness.

46. The scope of uniqueness of an identifier indicates the breadth of the application over which the identifier will remain unique. If, for example, a simple numbering scheme is used to identify the contents of a film library, by counting using integer numbers starting at 1, then that identifier will be unique only within that library. Suppose that the library is within the context of a television station that also has a library of commercials and that the commercial library also uses as identifiers integer numbers starting at 1. Then, if someone asks simply for item number 1432, it will not be clear whether it is film 1432 that is desired or commercial 1432. More must be specified to determine which of the items is needed. In this case then, the scope of the film identifiers is the film library, and the scope of the commercial identifiers is the commercial library.

47. In our imaginary television station, if the films in the library were always given a prefix of F, the commercials were always given a prefix of C, slides were always given a prefix of S, news clips were always given a prefix of N, electronic graphics were always given a prefix of G, and so on, then the material identifiers would have a scope encompassing the entire television station's operations. The important point is that the identifiers would be unique across the range of uses in which they would be applied. At the same time, there would be nothing to prevent another television station from using the same scheme and the same numbers to indicate completely different content. If it was necessary to have the same identifiers refer to the same material across a group of such television stations, then an even

more complex scheme probably would be required to assure the uniqueness needed across the scope of the application.

48. One way to create uniqueness across a wider and wider scope is to concatenate unique elements as part of an identifier. In our television station example, if several commercials are stored on each of a large number of videotapes, then combining a unique videotape number with a unique cut number on the tape will provide unique identification of each of the commercials in the identification system. Similarly, if each of a number of television stations uses the same identification scheme internally and prefixes each of its pieces of content with its call letters, then identification will be unique across all of the television stations participating in the system.

49. The degree of uniqueness of an identifier indicates requirements with respect to the duplication of identifiers within a system. One of skill in the art would understand that, generally, the term unique identifier means that there is a one-to-one correspondence between an identifier and an object. But systems are not always perfect, and mistakes can be made by human operators, too. If a system is used to identify material that is to be played back on a television station, then there is no problem with having two identifiers for the same piece of content, for example, since either identifier will result in the correct material being played back at the desired time. But if one identifier is used for two different pieces of content, the result can be disastrous, with no way to be certain that the correct material will be played back at the desired time. From another perspective, in the first case, with two identifiers for the same material, if the identifiers are used as part of the scheduling process and there is a need to avoid repetition of the material by more than a certain amount, then the possibility would exist to violate the requirement by a factor of two on the repetition rate. Thus, it is important to understand the application to evaluate the degree of uniqueness required.

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50. Once having established a unique identifier for the scope in which the identifier must exist, then one of ordinary skill in the art would have understood that it is possible to create a number of different coding schemes for expressing the identifier, all of which will retain the uniqueness of the identifier. Examples of coding an identifier in several ways are putting it into the ASCII code that is used in computers to express letters, numbers, and punctuation characters, printing those human readable characters onto a label that can be applied to the side of a film can, or printing those characters in the form of bar codes that can be read by machines but generally not by humans. In each of these cases, the identifier remains the same, but its coding varies according to the need of the application.

51. When computers are involved, one of skill in the art would understand that information is often stored in the form of databases. In the inner workings of a database, an additional identifier may be used to tag the information and assure its uniqueness within the database. Often called a "primary key," such identifiers may exist in parallel with other unique identifiers for information that can also be stored in the database. Indeed, a primary key may not be revealed to someone using a database but nevertheless may be used by the database to make its operations more efficient. Such primary key approaches have been known for a long time and were used, for example, in the dBase program that was first released for use on IBM PC compatible microcomputers in August, 1982. It, in turn, was based on programs dating back into the 1960's. When database utilization expands across many users and companies, the maintenance of a unique primary key often is the glue that holds the system together in such wide applications.

ii. Contemporaneous Common Knowledge

52. There was a substantial amount of common knowledge on the part of persons skilled in the art by early 1991 in such areas as television automation system operations and software-based systems. Each of these would have been important to someone of ordinary skill in the art implementing the '702 patent. Television

automation systems had been in use since the late 1960's on a variety of platforms. They became computerized in the early 1970's and have continually become more advanced since then.

53. Early stage television automation systems were typically for the purpose of reducing the number of errors made by human operators in the playing back of content, particularly commercials, on broadcast television stations. Later, they allowed significant reductions in the staffing levels required to operate television networks and stations while simultaneously increasing the reliability of the playback process of material intended for viewing by the public.

54. Television automation systems were based on computerized databases that kept track of the programs that were intended to be played at a given time, made sure those programs and other interstitial content were available to the system sufficiently far ahead of the times at which they were to be played back, confirmed that the correct material was played back at the prescribed times, and fed back into billing and other back office systems information about the correct (or incorrect) processing of the program schedule and the resulting playback to the public. By 1991, they were pervasive in the television industry and were being applied at broadcast and cable networks and at broadcast television stations. Variants of such automation systems were being used to insert commercials at cable headends and for early so-called "near video-on-demand" systems.

55. In the realm of software-based systems, databases were well known to persons skilled in the art and were available in forms that allowed ordinary users of personal computers to write complex applications based upon them. They used primary key techniques to assure uniqueness within databases, even if the information related to multiple entries in those databases was in all other ways identical. On larger systems, they provided mechanisms that allowed multiple users to access the same information at the same time. They similarly used methods that prevented collisions between entries being made by multiple users into the same areas of a database.

iii. Examples

56. A couple of real world examples may help to clarify the state of knowledge regarding identification encoding prior to early 1991. Both are examples of systems on which I personally worked during my tenure with Westinghouse Broadcasting Company from 1972 to 1984.

57. At KYW Television, in Philadelphia, starting in 1972, a system was installed providing automation of the station's master control operations for playing back television programming to the viewing public. It was built originally by Central Dynamics Laboratories, a Canadian company, using a combination of special purpose equipment for video and audio control and standard computer hardware for the automation functions and was updated with respect to its software over time by Westinghouse personnel. During early 1976, I operated that automation system on a regularly scheduled work shift, having responsibility for making sure that all of the material needed for playback was properly loaded on machinery and identified to the system. If any errors occurred, I manually intervened to correct the situation and made appropriate notations in the station's operating log. In 1977, I worked on revisions to the design of the automation system to permit automatic information interchange between some of the machinery and the control computer system. This eliminated the need for operators to enter identification numbers into the control system, allowing the machinery to determine the numbers on its own and to communicate that information to the control system.

58. The automation system in 1976-77 used a unique identifier for tagging all of the content that was to be played back to the public. That identifier was called a "house number," as it is in many television operations to this day. The house number was unique across the scope of the station's broadcast operations but did not cover news and public affairs production activities. House numbers were assigned to specific content in a front end part of the automation system called the traffic system. They were associated with all programs, commercials, promotional materials, slides,

audio tapes, and the like. Where it was possible to encode the house numbers into the videotapes that ran on some of the machinery, that was done to allow automated identification of content without operator intervention. Later, systems were installed to permit reading of the house numbers from bar coded labels attached to the carriers of content that could not be directly coded within the data.

59. When I was engineering manager at KPIX Television, the Westinghouse Broadcasting station in San Francisco, during 1982 and 1983, we purchased a still store system that included a database called a central lending library. A still store is a device that stores still images similar to slides, but those still images may have originated from slides, or from electronic graphics created as stills, or from still frames captured from moving video images. The still store system that we installed used a number of networked still store devices that stored their images on a large set of centralized computer disks and that could exchange images between themselves. The database resided on a minicomputer that communicated with all of the still store devices and with computer terminals that could be used to search for content based on descriptive information about it. The sort of search that could be conducted was based on the use of "key words" that helped find content through a hierarchical structure of information. Today, that kind of information is called "metadata," which means data about data, or, as Nicholas Negroponte of the MIT Media Lab says, "bits about the bits."

60. In the central lending library system, there was a unique identifier system that applied not only to the stills stored on the system but also to material that was stored off line. As originally envisioned by its manufacturer, Quantel plc of the United Kingdom, the central lending library could deal only with stills, tracking them when they were on line and when they were on media that had been removed from the system and stored on a shelf. In my negotiations with the manufacturer for the first central lending library to be installed worldwide, I demanded that the scope of uniqueness of the identifier be expanded to cover not only off-line still images but

also video clips that had never been entered into the system. This allowed tracking and retrieval of the many thousands of news clips, public affairs interviews, and field production shots that were in the station's library, using the same mechanism that was originally only intended for stills.

61. A primary key was generated by the central lending library system for each still loaded into the system and for each external reference to a clip, shot, or the like. That primary key was associated with the metadata about the particular content and with information about the location of the content on the various on-line and off-line media. For stills actually loaded onto the system, the primary key information (as well as the metadata) was also encoded into the data for that still so that, if the database were ever corrupted, it would be possible to read back all of the stills and collect the information necessary to rebuild the database. Over the decade of the 1980's, numerous competitive systems to the central lending library came onto the market, expanding their applications from stills stored on such systems to actual video clips stored on devices called video servers. Many of the video servers were associated with databases that assigned unique identifiers to allow tracking of the content they stored.

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iv. Conclusions Regarding Meaning Of Identification Encoder

62. Given all of the preceding, I conclude that one of ordinary skill in the art in January, 1991, would have understood the meaning of the term Identification Encoder. That person would have understood it to be a computer program or routine, running on either standard or specialized computer hardware, that assigned a unique identification code to each content item in such a way as to differentiate it from all other such content items on the system and to allow its processing and retrieval in conjunction with the other elements described in the patent.

63. The person of ordinary skill in the art would have understood the Identification Encoder to have an input, for example, from a source material library; to have at least the function of assigning unique identification codes to the

information obtained from material stored in a source library or other source of information, along with numerous other possible functions; and to have an output that provides information, for example, to a conversion means, to a digital input formatter for digital source data, to an analog-to-digital converter for analog source data, or directly to a compressed data formatter for previously compressed information. There is no question in my mind that the person of ordinary skill in the art in January, 1991 would have found the Identification Encoder to be understandable as described in the '702 patent.

E. Enablement Of The Identification Encoder

64. Given all of the information in the patent about the function and structure of the Identification Encoder, in January, 1991, one of ordinary skill in the art would have been enabled to design and build one without undue experimentation – indeed, without any experimentation. To start the design process, the person of ordinary skill in the art would have had to define the system characteristics in terms of the sort of computer on which the Identification Encoder routine would run, the types of interfaces that would be used on the input and output of the Identification Encoder, and the scope over which uniqueness of the identification code was required to be maintained. The scope, in turn, would be derived from a definition of the functionality of the overall system of which the Identification Encoder was to be a part.

65. One measure of the scope that would have to be considered is the size of the name or number space available for the identification code. If it was intended that the identifier would be exposed to users of the system as a means for providing input back into the system, then the size of the name or number would have to be limited to something that a human could easily remember or at least copy. That might limit the size of the name or number to perhaps six to ten digits or characters. Depending upon the number of content items planned to be carried on the system, both at one time and over its life, it might be necessary to reuse names or numbers to identify different

content at different times. The outcome of this decision would determine just how the algorithm would be structured for the Identification Encoder.

66. If a human would never be involved in handling or processing the identification code, then a very large number of digits or characters could be used and the name/number space sized so as never to run out of space over the expected lifetime of the system, given the expected additions to the library over that lifetime, also taking into account a safety factor. On the other hand, if a human would have to deal with the identification code, perhaps by reading it from a screen and entering it into a telephone number pad or by reading it from a newspaper listing and entering it into a television remote control, then it would have to be limited in size. If it could be expected that there would be more content items carried on the system over its lifetime than the size of the name or number space would accommodate in one use, then it would be necessary to develop an algorithm that would allow for reuse of the name or number space.

67. Once having determined the appropriate size of the name or number space and whether or not it would be necessary to reuse the names or numbers in it, it would have been a straightforward exercise in algorithm development and software writing to fashion an appropriate Identification Encoder for the system's objectives and basic structure. No real experimentation would have been required, and any practitioner of the art of software development and writing easily could have produced the necessary computer code in any one of several forms – using assembly coding or a high level language. Thus, I conclude that one of ordinary skill in the art in January, 1991 would have been enabled by the information contained in the patent and the information generally available to make and use the Identification Encoder described in the '702 patent.

F. Meaning Of Sequence Encoder

68. The term "Sequence Encoder" does not appear in the specification of the '702 patent except in the claims. Nevertheless, if one of ordinary skill in the art had

considered the patent in the January, 1991, time frame, that person would understand, in light of the specification, the meaning of that term. Once knowing what the patent describes, he or she could have examined the various properties and applied to them what else would have been known about them at the time of the patent.

69. To determine what the term "Sequence Encoder" was really referencing, it would be necessary to look at all the uses of the term "encoder" in the patent, eliminating those that clearly apply to other types of encoding. Then, those that remained could be studied for their descriptions of sequencing operations of one sort or another and perhaps their proximity in the text to the word "sequence" in its various forms. First, it would be important to understand the meaning of the word "sequence" in order to discern its relationship to the other elements of the patent.

70. As defined in the IEEE Standard Dictionary of Electrical and Electronics Terms, 1996 electronic edition, a "sequence" is "the order in which items are arranged" or "a set of items that have been sequenced." From the same source, considering the verb form, to "sequence" something is "to place items in a linear arrangement in accordance with the order of the natural numbers. Note: Methods or procedures may be specified for other natural linear orders by mapping onto the natural numbers. For example, the sequence may be alphabetic or chronological." Based on the earlier discussion about the compounding of terms to create easily understood extensions to basic concepts, a Sequence Encoder would be an encoder for the purpose of establishing the sequence of items or objects. It would have an input, a function, and an output.

71. Scrutinizing the '702 patent as one of ordinary skill in the art would have done in January, 1991, there are 55 instances of the word "encoder" in the specification, excluding any in the abstract and those in the claims. Of these, as shown in Annex A, 32 apply to the Identification Encoder, one applies to "television encoding," and four apply to "transmission encoding," accounting for 37 of the 55 instances. Of the remaining 18, two describe miscellaneous encoding of one sort or

another. This leaves 16 instances of "encoding" and its related forms. As it turns out, all 16 are modified by the word "time," resulting in "time encoder," "time encoding," and "time encoded."

72. Further scrutinizing the '702 patent for the word "sequence" in the specification (other than the abstract and claims), one of ordinary skill in the art would have found that there are 12 instances of the word or an alternative form ("sequenced"). Of these instances, four describe a "sequence of addressable data blocks," three describe "formatted & sequenced data," three describe "compressed sequenced data," and the other two refer to miscellaneous sequencing functions.

73. Upon inspecting the relationship between the instances of "sequence" and "time encoder," there are a number of connections described in the specification and claims. For example, "the present invention...includes ordering means for placing the formatted information into a sequence of addressable data blocks....[T]he ordering means... includes time encoder 114." (7:49-53) "The sequence of addressable data blocks which was time encoded and output by time encoder 114 is...sent to precompression processor 115." (8:45-48) "The processing...includes...placing the formatted data into a sequence of addressable data blocks by ordering means 114... (18:15-19). "[S]aid sequence encoder transforms digital data blocks into a group of addressable data blocks." (Claim 7)

74. Another way that one of ordinary skill in the art in January, 1991, would have understood the relationship between the Sequence Encoder and the Time Encoder is through a comparison of Figure 7 with Figure 2a. In Figure 7, there is a flow chart describing a process the first portion of which parallels the device arrangement in Figure 2a (and the latter portion of which parallels the device arrangements in Figures 2b and 6.) In Figure 7, there is the first step 412 of retrieving information for selected items (from the source material library 111 of Figure 2a). This is followed by assigning a unique identification code 413a in identification encoding process 112, placing the data in a predetermined format 413b in format

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converter 125, sequencing the data 413c in time encoder 114, compressing the data 413d in the pre-compression data processing 115 and video and audio compression 129 and 128 blocks, and storing the data as a file 413e in the compressed data formatting section 117. It is apparent from this direct correspondence between the steps of the process and the blocks of the system that the sequencing of the data in 413c of Figure 7 takes place in the time encoding portion 114 of the block diagram of Figure 2a. Hence, the Time Encoder performs the sequencing function and therefore also is the Sequence Encoder.

75. From the foregoing, it would have been apparent to one of ordinary skill in the art in January, 1991, that the Sequence Encoder of the claims is the Time Encoder of the specification since its purpose includes placing information into a sequence of addressable data blocks, the sequence of addressable data blocks is time encoded and output by the time encoder, the ordering means 114 (which is the time encoder) places the formatted data into a sequence of addressable data blocks, and the sequence encoder transforms digital data blocks into a group of addressable data blocks.

76. Once having understood that the Sequence Encoder is the Time Encoder, it would become possible for the person of ordinary skill in the art in January, 1991, to discern the properties of a Sequence Encoder as described in the '702 patent. The following table lists the evident properties of the Sequence (i.e., Time) Encoder. Also included are indications of the aspects of the encoder (input / function / output) that each of the properties describes and a notation of the occurrence of the term in the patent that teaches us about the property.

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Property	Aspect	Occurrence
Serves as the ordering means for placing formatted information into a sequence of addressable data blocks	Function	22, 25
Time encodes retrieved information formatted and converted by the converter	Input	23, 24
Makes possible addressing of the addressable data blocks	Function	26
Makes possible realignment of video and audio information in the compressed data formatting section	Function	27
Assigns relative time markers to video and audio as it passes through	Function	28, 29, 39
Makes possible realignment of video and audio data and user addressing of particular portions of items	Function	31
Makes items and subsets of items retrievable and addressable	Function	33, 34
Enables subsequent compression of the information to be improved	Function	35
Sends the sequence of addressable data blocks to the precompression processor at various frame rates and in various formats	Output	36, 37, 38

77. To better understand the significance of the properties of a Sequence Encoder listed in the table above, it is helpful to consider what time relationships are required between audio and video content, what was common knowledge about the sort of system described in the patent at the time of its first filing, and what might be some contemporaneous examples of other systems of the type described in the patent about which one of ordinary skill in the art would have been aware in January 1991.

i. Time Relationships Required

78. A fundamental requirement for the operation of the system described in the '702 patent is a way to retain information about the sequence of content put into the system so that that information can be brought back out in the same sequence. It is also important that information of different types put into the system in synchronization with one another can be retrieved with the synchronization maintained or reconstructed. This is necessary to ensure that the viewing experience for content retrieved from the system matches that for the same content input to the system.

79. Examples of the type of time relationship required are between video and audio and between video, audio, and closed captions. With respect to video and audio, the time synchronization determines the visibility of any "lip sync" errors when playback of the video and audio is not at precisely the original timing. Generally, it is accepted that the audio should never lead the video by more than about ½ frame at standard U.S. television frame rates and should never lag the video by more than about 1½ frames. Otherwise, it will become apparent to viewers that a person's lips are not moving in the proper relationship to the sounds that he or she is making, and the resulting effect can be rather disconcerting to many viewers.

80. When closed captions are added to a program, it is also important for their time relationship to be maintained with respect to the video and audio of the program. Since people who are unable to hear and people in environments in which the sound would be annoying or would be hidden by noise depend on the captions to learn what is being said in a program, it is just as important to maintain the time relationship between the captions and the other elements as it is to maintain the video-audio timing if those viewers are to have a pleasing viewing experience. While the tolerances are perhaps a little larger than for video and audio taken together, it is still necessary to keep them at relatively low levels if viewers are to have a satisfying experience.

81. These issues are exacerbated when it is recognized that digital video and audio compression are to be applied to the content stored on, communicated by, and retrieved from the system. The compression and decompression processes for video and audio have inherently different time delays for the completion of their respective functions. It is therefore mandatory to provide mechanisms allowing recognition of the time relationships between program elements and reestablishment of those relationships at appropriate points in the system – particularly on the outputs presented to viewers.

ii. Contemporaneous Common knowledge

82. Because it is often helpful in the creation and processing of content for television programs and commercials, feature films, short documentaries, and the like, to separate the handling of the video and the audio into different production and post production processes, techniques long ago were developed to permit such "dual system" operations. One of the principal methods enabling dual system procedures is the use of a time code carried and stored with each element of a work to identify the time relationships between elements and to permit their reconstruction. Time code is similarly used in the process of editing content for artistic, editorial, or time constraint reasons. Time code was originally developed to enable precise control of the timing of the editing processes on complex videotape machines that were not designed with editing in mind.

83. As a result of the pervasive need for time code in the processing and delivery of television programming, the creation of feature films, and the editing and processing of audio recordings, it has become an area for standardization of the techniques having very wide adoption on a worldwide basis. The preeminent standard for time code in the electronic media industries is the SMPTE 12M standard of the Society of Motion Picture and Television Engineers. It has been in use for nearly 30 years and serves the needs of the film, television, audio, and similar industry segments. It was in widespread use in 1991 and would have been well known to one of ordinary skill in the art at that time.

iii. Example

84. In the period from 1976 to 1978, while working at KYW Television in Philadelphia, I supervised the crew that produced the Mike Douglas Show on nearly a daily basis. When I took over supervising the crew, the program was routinely edited using methods involving actually cutting the videotape and splicing together the ends of the sections to be joined to create an edit. The tape was 2 inches wide, and the locations of the magnetic tracks on the tape needed to be precisely determined by

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applying a liquid that allowed "developing" the tape to see where the tracks were. Then the tracks on the two ends of the tape to be spliced had to be matched under a microscope before a razor blade could be used to cut the tape ends and a narrow band of a special splicing tape applied across the diagonal cut. Because of the fragility of the physical edits, it was necessary to make a copy of the tape immediately before further physical handling, which meant that the quality of the content was degraded because of the deterioration of the signal caused by the copying ("dubbing") process.

85. During the time that I was supervising the Douglas Show crew, we installed one of the first time-code-based videotape editing systems, made by a company called EECO (Electronic Engineering Company of California). The EECO time code was a proprietary progenitor of the SMPTE 12M time code, but it nevertheless allowed a great deal of improvement in the post production operations for the show. In particular, because it precisely controlled the timing of the various functions of the machines and allowed frame-accurate relationships between the various source signals and the output to the machine upon which the edit recording was being made, it greatly increased the efficiency of the editing process. This, in turn, had an impact not just on the amount of time that it took to post-produce the show, but it also allowed far more creative editing to be done and with a higher technical quality product resulting. The outcome was a show with much higher production values and consequently a much improved viewer experience.

iv. Conclusions Regarding Meaning Of Sequence Encoder

86. Given all of the preceding, I conclude that one of ordinary skill in the art in January, 1991 would have understood the term Sequence Encoder to mean the Time Encoder described in the specification and would have understood the functions of the Time Encoder. That person would have understood it most likely to be special purpose hardware generating a time code and associating it simultaneously with the video and audio of the content or a computer program or routine, running on either standard or specialized computer hardware, for the same purpose. After association of

the time code, it would be maintained with the related program elements so that they could be reassembled into the same time relationship as that with which they were originally entered into the system. The reestablishment of the time relationship could be done using a computer software routine or specialized hardware at any point desired – before or after compression, storage, or delivery.

87. The person of ordinary skill in the art would have understood the Sequence (Time) Encoder to have an input, for example, from a format converter; to have at least the function of generating time codes and associating them with the video and audio streams passing through it, for example, from the source material library by way of the Identification Encoder and the format converter, along with several other possible functions; and to have an output that provided information, for example, to a pre-compression data processing subsystem. There is no question in my mind that the person of ordinary skill in the art in January, 1991 would have found the Sequence (Time) Encoder to be understandable as described in the '702 patent.

I declare under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge, and that I executed this declaration on October 20, 2004 at Los Angeles, California.

S. Merrill Weiss

S. MERRILL WEISS

Annex A

Annex A – Uses of the Term "Encoder"

To aid in determining the form of encoder referenced by each use of the term or of its related forms (encode, encodes, encoding) in the '702 patent, a table was prepared including each of the 55 instances of such uses in the specification. (The total of 55 does not include any uses in the abstract or in the claims.) The table is organized by category, but the instances are numbered in the sequence in which they appear in the patent. Also given are the column and line numbers of each occurrence.

In some cases, the term uses are close to one another in the text and related to the same subject. In these situations, they are shown in the same cells in the table, and the numbers and references for all instances are therefore listed in the same row in the table. In each case of a use of a term, the term is bolded in the text, and any modifier to the term is italicized.

Occurrence	Reference	Text
Identification Encoding		
1 2	2:34-38	"…*identification* **encoding** means for retrieving the information for the items from the source material library means and for assigning a unique identification code to the retrieved information; conversion means, coupled to *identification* **encoding** means, for placing …"
3	2:45-48	"…for storing as a file the compressed sequenced data received from the compression means with the unique identification code assigned by the *identification* **encoding** means;…"
6 7	5:33-35	"To achieve copy protection, the requested material, as an item, is **encoded** *as copy protected* during *storage* **encoding** in transmission system 100."
8	6:31-34	"Prior to being made accessible to a user of the transmission and receiving system of the present invention, the item must be stored in at least one compressed data library 118, and given a unique identification code by *identification* **encoder** 112."
9 10 11	6:34-42	"*Storage* **encoding**, performed by *identification* **encoder** 112, aside form [sic] giving the item a unique identification code, optionally involves logging details about the item, called program notes, and assigning the item a popularity code. *Storage* **encoding** may be performed just prior to conversion of the item for transmission to reception system 200, at any time after starting the conversion process, or after storing the item in the compressed data library 118."
12	6:43-47	"In a preferred embodiment of the present invention, the method of **encoding** the information involves assigning a unique identification code and a file address to the item, assigning a popularity code, and inputting the program notes."

Occurrence	Reference	Text
13 14 15 16	6:52-58	"In the preferred embodiment, after *identification* **encoding** is performed by *identification* **encoder** 112, the retrieved information is placed into a predetermined format as formatted data by the converter 113. The items stored in source material library 11 and **encoded** by *identification* **encoder** 112 may be in either analog or digital form."
17	6:62-64	"When the information from *identification* **encoder** 112 is digital, the digital signal is input to the digital input receiver 124 where it is converted to a proper voltage."
19	7:6-9	"When the retrieved information from *identification* **encoder** 112 is analog, the information is input to an analog-to-digital converter 123 to convert the analog data of the retrieved information into a series of digital data bytes."
20	7:15-18	"The analog video converter 123b preferably converts the analog video information, retrieved from *identification* **encoder** 123, into pcm data also at fixed sampling rates."
21	7:39-41	"In such a case, retrieved items are passed directly from *identification* **encoder** 112 to the compressed data formatter 117."
32	8:29-32	"Internal to the system, the song is associated with a starting frame number, which was indexed by the system operator via the *storage* **encoding** process."
39	10:7-11	"The file may contain the compressed audio and/or video data, time markers, and the program notes. The file is addressable through the unique identification code assigned to the data by the *identification* **encoder** 112."
40	10:36-39	"The unique address code is an address assigned to the item by the system operator during *storage* **encoding**, which is preferably done prior to long term storage in the compressed data library 118."
41 42	10:44-45	"The *storage* **encoding** process performed by **encoder** 112 also allows entry of item notes and production credits."
43 44 45 46 47	10:51-64	"Item addresses are mapped to item names by *identification* **encoder** 112 and may preferably be used as an alternative method of accessing items. The item names are easier to remember, thus making user access more intuitive by using item names. The *storage* **encoding** entry process performed in *identification* **encoder** 112 operates a program which updates a master item database containing facts regarding items in the compressed data library system. The *storage* **encoding** process may be run by the system operator whereby the system operator accesses the master item database to track and describe items stored in one or more compressed data libraries. The names and other facts in the item database may preferably be updated at any time via the *storage* **encoding** process."

Occurrence	Reference	Text
48 49	12:4-5	"The *storage* **encoding** process performed by *identification* **encoder** 112 also allows entry of a popularity code."
54	18:11-15	"The processing performed in step 413 preferably includes assigning a unique identification code to the retrieved information performed by *identification* **encoder** 112, shown and described with respect to FIG. 2a (step 413a)."
55	18:20-25	"Processing step 413 also includes compressing the formatted and sequenced data performed by data compressor 116 (step 413d), and storing as a file the compressed sequenced data received from the data compression means with the unique identification assigned by the *identification* **encoding** means (step 413e)."
Sequence Encoding		
22 23 24 25 26 27	7:49-63	"The transmission system 100 of the present invention also preferably includes ordering means for placing the formatted information into a sequence of addressable data blocks. As shown in FIG. 2a, the ordering means in the preferred embodiment includes *time* **encoder** 114. After the retrieved information is converted and formatted by the converter 113, the information may be *time* **encoded** by the *time* **encoder** 114. *Time* **encoder** 114 places the blocks of converted formatted information from converter 113 into a group of addressable blocks. The preferred addressing scheme employs *time* **encoding**. *Time* **encoding** allows realignment of the audio and video information in the compressed data formatting section 117 after separate audio and video compression processing by precompression processor 115 and compressor 116."
28 29 30 31	8:6-12	"*Time* **encoding** by *time* **encoder** 114 is achieved by assigning relative time markers to the audio and video data as it passes from the converter 113 through the *time* **encoder** 114 to the precompression processor 115. Realignment of audio and video data, system addressing of particular data byes, and user addressing of particular portions of items are all made possible through *time* **encoding**."

Occurrence	Reference	Text
33 34 35	8:32-42	"The system item database may contain information records for individual frames or groups of frames. These can represent still frames, chapters, songs, book pages, etc. The frames are a subset of, and are contained within, the items stored in the compressed data library 118. *Time* **encoding** by *time* **encoder** 114 makes items and subsets of items retrievable and addressable throughout the transmission system 100. *Time* **encoding** enables subsequent compression of the information to be improved because data reduction processes may be performed in the time dimension."
36 37 38	8-45-49	"The sequence of addressable data blocks which was *time* **encoded** and output by *time* **encoder** 114 is preferably sent to precompression processor 115. The data arriving from *time* **encoder** 114 may be at various frame rates and of various formats."
Transmission Encoding		
50	15:13-14	"The conversion performed by transmission data converter 119 **encodes** the data for the transmission channel."
51 52 53	15:45-52	"That is, the computer controlling the transmission que [sic] tells the *transmission* **encoding** computer its task and then the task is executed by the *transmission* **encoding** computer, independent of the transmission queue computer. The transmission queue computer provides the data for transmission by the file server which also distributes to other transmitters located in the same or other *transmission* **encoding** computers."
Television Encoding		
4	4:45-48	"Thus, distribution may be provided to users via standard *television* **encoding** methods downstream of the head end of the cable distribution system."
Miscellaneous Encoding		
5	4:63-66	"...the requested material may be fully compressed and **encoded**, partly decompressed at some stage in transmission system 100, or fully decompressed prior to transmission."
18	6:64-66	"A formatter 125 sets the correct bit rates and **encodes** into least significant bit (lsb) first pulse code modulated (pcm) data."

Annex B

Annex B

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Merrill Weiss Group

Consultants in Electronic Media Technology/Management

Resume of S. Merrill Weiss

SUMMARY:

- Over thirty-five years experience in broadcasting and related fields with over twenty-six years in management and consulting.
- Executive management as president of a start-up electronics company.
- Management of a large, in-house technical design and construction operation with significant staff and budget responsibilities.
- Project management from concept and definition, through planning and budgeting, systems and technical design, to supervision of installation and operation.
- All aspects and levels of broadcast station technical operation and management.
- Extensive participation in FCC Advisory Committee on Advanced Television Service process for selection of the next generation of television for the United States.
- Designed systems and techniques that have become industry standards, both documented and de facto. Responsible for technical support of several significant changes to FCC Rules.
- Presented or published over one hundred papers or articles on various aspects of video, digital video compression, High Definition Television, broadcasting, and wireless cable. Author of two books on ATV/DTV/HDTV.
- Member or chairman of numerous industry technical standards committees and producer of several tests and demonstrations leading to important international standards. Co-chairman of EBU/SMPTE Task Force on Harmonized Standards for Exchange of Program Material as Bit Streams. Founder and facilitator of the Video Services Forum.
- Fellow of Society of Motion Picture and Television Engineers and highest level of Certification (Professional Broadcast Engineer) by Society of Broadcast Engineers. Recipient of David Sarnoff Gold Medal (1995). Nominated for Emmy Award (1993).

PROFESSIONAL EXPERIENCE: Detailed on the following pages.

AWARDS, PATENT, EDUCATION, CERTIFICATION, LICENSES: Follows Professional Experience.

PROFESSIONAL ACTIVITIES: See Attachment A.

PAPERS AND PUBLICATIONS: See Attachment B.

PROFESSIONAL EXPERIENCE:

February, 1991 to Present
Consultant in Electronic Media
Technology/Management

Merrill Weiss Group
227 Central Avenue
Metuchen, NJ 08840-1242

Providing consulting services in the general area of electronic media technology, technology management, and general management to a wide range of clients. Included among international clients have been investment bankers, research laboratories, industry organizations, intellectual property attorneys, manufacturing companies, television networks, television stations and group owners, wireless cable and wireless broadband access system operators, cable multiple system operators, the United States government, and major Hollywood studios. Assignments have included analysis of technology and management of a take-over target; development of digital image compression technology for use by an industry segment; development of technology strategies for several companies and industry segments; participation in government and industry standardization activities; serving as an expert witness; facilitation of an industry organization for technology and operations coordination among cooperating/competing companies; market research; request for proposal and proposal preparation for system and equipment purchases and sales, respectively; system analysis; propagation/interference analysis; FCC license application preparation; project management; studio, earth station, and transmitter plant system design and implementation; system automation; report writing and editing; among others.

October, 1985, to April, 1991
Managing Director,
Advanced Television Systems
Managing Director,
Systems Engineering

Operations and Technical
Services
National Broadcasting Co.
30 Rockefeller Plaza
New York, NY 10112

As Managing Director, Systems Engineering, held management responsibility for in-house technical design and construction activity for NBC facilities in New York and Burbank. Turned organization around to on-time and on-budget performance while increasing size of activity from $30 million to $50 million in annual project load. Responsible for projects that started the automation of NBC studio facilities and on-air delayed playback. Oversaw numerous other projects while supervising staff of 140+, including union and management, with 36 design engineers. Initiated conversion to Computer Aided Design (CAD) and computer supported project management using IBM mainframe, workstations, and networked PCs for fully integrated department management, project reporting and control.

As Managing Director, Advanced Television Systems, had responsibility for NBC's work in the development of Advanced Television systems. This included NBC participation in Advanced Compatible Television (ACTV), a single channel, compatible EDTV system, and in Advanced Television Research Consortium (ATRC) development of Advanced Digital HDTV (AD-HDTV), a simulcast HDTV system for terrestrial broadcast. Represented NBC in the FCC Advisory Committee on Advanced Television Service process, including numerous committee activities. Also had responsibility for NBC production in HDTV in support of research and demonstrations. Managed ATRC demonstration at 1990 National Association of Broadcasters (NAB) Convention.

February, 1984, thru October, 1985
President

Imagex Corporation
5500 Shellmound Street
Suite 200
Emeryville, CA 94608

Part of a group that put together a company to work in the image database and video editing fields. Included were systems integration and software development. A video editor was developed and sold to another company to continue its development and bring it to market. The software written to support the image database had wide applications in other fields and was sold for those purposes. The image database product was demonstrated to a number of potential customers with quite positive responses, but required venture funding to complete its development was not obtained. The company therefore ceased operation.

February, 1978, thru January, 1984
Engineering Manager
Assistant Engineering Manager

KPIX Television
Westinghouse Broadcasting Co.
855 Battery Street
San Francisco, CA 94111

As Assistant Engineering Manager, designed and supervised the construction of a new studio facility for this major, fifth market TV station within a two-year time frame. Included in the project was design of a microcomputerized machine control system upon which the SMPTE/EBU standard is partially based. Also designed a microcomputerized control system which interfaced videotape cartridge machines to both a master control automation system and the machine control system. Devised the first use of alphanumeric displays in production equipment, including video switchers, routing switchers, and audio consoles. Numerous design innovations made KPIX the model for new stations and major upgrades for nearly a decade. Also responsible for day-to-day operations of old and new facilities. Responsible for FCC rules compliance and for preparing comments for Group W (Westinghouse) to FCC rule-making proceedings. Upon completion of new facility, began five year program of further development contemplated in the initial design.

As Engineering Manager, managed an engineering department with a staff of 50+, operating budget of $2.5+ million, and capital outlays accumulating to $4+ million at any one time. Designed and managed construction of $1+ million earth station facility, including San Francisco's first broadcast uplink. Purchased and installed first Central Lending Library still store system and first U.S. installation of new, fully automated studio cameras. Designed and purchased telco bypass system using non-broadcast microwave frequencies to control costs by replacing leased lines. Completed five-year development program in four years.

April, 1976, to February, 1978
Engineering Supervisor

KYW Television
Westinghouse Broadcasting Co.
Independence Mall East
Philadelphia, PA 19106

Managed design and installation projects, day-to-day operations, remotes, and special program activities. Supervised crew producing nationally syndicated Mike Douglas Show. Supervised first complete conversion of a major market television station news operation to ENG. Produced first international satellite broadcast by a local television station, feeding a domestic one-time-only network.

March, 1972, to April, 1976
Engineering Technician

KYW Radio
Westinghouse Broadcasting Co.
Independence Mall East
Philadelphia, PA 19106

Participated in design and installed new studio facilities for this all-news radio station. Designed and built specialized equipment for news operations including one of the first high fidelity radio ENG operations; full duplex, special purpose radios, including portables, to extend the studio into the field; and a network alerting system for the Group W radio group.

April, 1968, to March, 1972
Engineering Technician

WHYY, Incorporated
WHYY-TV, WUHY-TV, WUHY-FM
Philadelphia, PA 19106

Designed and built new studio facilities for this public broadcaster's radio station. Helped construct Pennsylvania Public Television Network's initial Network Operations Center, located at WHYY. Involved in day-to-day operation of the stations and in maintenance.

February, 1967, to April, 1968
Engineering Technician

WIP Radio & WMMR-FM
Metromedia Broadcasting
Philadelphia, PA 19103

Involved in day-to-day operation of the stations and in maintenance.

AWARDS, PATENT, EDUCATION, CERTIFICATION, LICENSES:

Elected Fellow by Society of Motion Picture and Television Engineers (SMPTE), 1987.

David Sarnoff Gold Medal recipient, SMPTE, 1995, "recognizing outstanding contributions in the development of new techniques or equipment that have contributed to the improvement of the engineering phases of television."

Emmy Award nomination by National Academy of Television Arts and Sciences (NATAS), 1993, for "development of the technology and the international consensus on standards for the Serial Digital Interface for interconnection of television equipment."

U.S. Patent No. 5,812,220, "Television Transmission System Having Signal and Antenna Element Redundancy." Describes a method for combining a multiplicity of high power digital television stations into a single antenna in a small aperture. (Issued September 22, 1998)

B.B.A., 1976, Wharton School, University of Pennsylvania.
(Bachelor of Business Administration, Major in Management)

Certified Professional Broadcast Engineer, by Society of Broadcast Engineers (SBE), certified since 1980, endorsed for both AM/FM and Television (first person certified for both).

First Class FCC Radiotelephone license, since 1962.

Second Class FCC Radiotelegraph license, since 1962.

Amateur Extra Class FCC license, K2MW, since 1962 (first licensed 1959).

FCC ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE:

Systems Subcommittee:
Member, 1988 to 1995 (completion).

Systems Subcommittee Working Party 1 on Systems Analysis (SS/WP-1):
Member, 1988 to 1995 (completion);
SS/WP-1 Task Force on Systems Analysis: Member, 1990 to 1995 (completion).
SS/WP-1 COFDM Certification Expert Group: Member, 1995 (inception to completion)

Systems Subcommittee Working Party 3 on Economic Analysis (SS/WP-3):
Member, 1988 to 1995 (completion).

Implementation Subcommittee:
Member, 1988 to 1995 (completion).

Implementation Subcommittee Working Party 1 on Policy & Regulation:
Member, 1989 to 1995 (completion).

Implementation Subcommittee Working Party 2 on Transition Scenarios:
Vice Chairman, 1988 to 1995 (completion); Acting Chairman, 1989 to 1995.

Technical Sub-Group of the Special Panel, Expert Groups on Transport and Transmission
Member, 1993 to 1995 (completion).

SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS:

Society of Motion Picture and Television Engineers (SMPTE):
Member, 1978 to present;
Elected Fellow, 1987;
Engineering Director for Television, 1996 through 1999. Had broad responsibility for organization and management of television standards development on worldwide basis.

SMPTE Working Group on Digital Video Standards (WG-DVS):
Member, 1977 (inception) to 1985 (when superseded by WG-SVS);
Member, Drafting Committee for Composite Digital Interface Standard, Sept., 1978, to Feb., 1980;
Co-produced First Demonstrations of Component-Coded Digital Video, San Francisco, February, 1981, which were held at KPIX and which led to the first international agreement on digital sampling and coding, later embodied as standards in CCIR (now ITU-R) fRecommendation 601 and SMPTE 125M;
Member, Subcommittee on NTSC/Digital Interface, Apr. to Nov., 1981;
Member, Sub-Group on Digital Studio Implementation, June, 1981, to Nov., 1982.

SMPTE Working Group on Digital Control of Television Equipment:
Member, 1978 (inception) to 1984;
Conducted the tests, held at KPIX in October, 1980, that validated the standard interface then being adopted by the Working Group. KPIX had the only large system in existence that worked compatibly with the proposed standard and on which it could be tested. SMPTE standard was based on the KPIX microcomputer network design and interfaces.

SMPTE Working Group on Component Analog Video Standards (WG-CAVS):
Chairman, 1982 (inception) to 1985 (when superseded by WG-SVS);
Committee developed three standards simultaneously, two in coordination with the European Broadcasting Union (EBU). It also conducted four tests and public demonstrations of its techniques. This led to use throughout the industry of component analog techniques in facilities for over a decade.

SMPTE Working Group on Studio Video Standards (WG-SVS):
Chairman, 1985 (inception) to 1988;
Committee superseded both WG-DVS and WG-CAVS with broad responsibility for all video interface documentation for studio applications at standard scan rates. Personally developed strategy that led to conversion of television production from 8-bit to 10-bit amplitude resolution, including development of 10-bit Serial Digital Interface (SDI) at 270 Mb/s for component operation and 143 Mb/s and 177 Mb/s for composite operation that is now widely applied worldwide. Received Emmy Award nomination for this work.

SMPTE Working Group on Advanced Television Production (WG-ATVP):
Member, 1989 (inception) to 1996 (completion);
Committee had broad responsibility for all video interface documentation for studio applications at scan rates above the current standard;
Chairman, Ad Hoc Group on Document Design and Writing, 1989 to 1995;
Chairman, Ad Hoc Group on Systems Issues, 1989 to 1991.

SMPTE Working Group on ATV Studio Systems Design
Member, 1991 (inception) to 1996 (completion);
Chairman, Ad Hoc Group on Small Station and Cable Headend Considerations, 1992-1996.

SMPTE Working Group on Headers and Descriptors
Member, 1992 (inception) to 1998 (completion);
Committee developed techniques to permit transportation of digital video and audio data intermixed with unrelated data in a general purpose digital communications channel. Helped forge compromise that led to SMPTE Universal Labels standard.

SMPTE Committee on Television Technology (T14)
Member, 1982 through 1991 (completion);
Chairman, 1988 through 1991 (completion);
Committee oversaw activities of Working Groups on Advanced Television Production, Digital Audio Interfaces for Television, Digital Control of Television Equipment, Professional Studio Monitors, Studio Video Standards, the Study Group on Monitoring and Diagnostics in Digital Video Systems, and others.

SMPTE Committee on Television Production Technology (P18)
Chairman, 1992 (inception) through 1995;
Member, 1996 through 1998 (completion);
Committee had general responsibility for all standardization of matters related to television production, including such items as Television Compression Systems, Digital Headers and Descriptors, MPEG Liaison and Testing, Digital Control of Television Equipment, Editing Procedures, Time Code, and the like.

SMPTE Committee on Television Signal Technology (T14)
Member, 1992 (inception) through 1998 (completion);
Committee had general responsibility for all standardization of matters related to interfaces between television equipment of all sorts, including such items as High Definition Serial Interfaces, Serial Digital Fiber Interfaces, Digital Audio Interfaces for Television, Ancillary Data, Jitter, Monitoring and Diagnostics, and the like.

SMPTE Committee on Packetized Television Technology (PT20)
Chairman during formation in late 1995 (relinquished when appointed Engrg. Dir. for TV);
Member 1996 through 1998 (completion);
Committee had general responsibility for all standardization of matters related to television carried in packetized form, including Digital Video Compression Techniques and Parameters, Interfaces and Protocols, Switching and Synchronization, System Design, and others.

SMPTE Engineering Director for Television
Appointed to four one-year terms, 1996 through 1999 (term limit)
Chairman of Television Standards Steering Committee (ST13-14)
Responsible for management of SMPTE television standards development on a worldwide basis including scheduling of meetings, assignment of projects, maintenance of workflow, coordination between committees of technical work. Provided oversight of standards development to assure compliance with SMPTE and ANSI requirements. During tenure in office, helped to increase document throughput several-fold.
Initiated regular, all-inclusive meeting series of television technology committees. Initiated regular meetings of TV Steering Committee during meeting series and participation by all committee and subcommittee leadership. Worked to turn SMPTE into internationally recognized standards body and initiated regular international meetings of TV technology committees. Implemented findings of joint SMPTE/EBU Task Force by reorganizing technology committees along lines of a layered structure and by promoting use of layering concepts necessary in documentation for future bit-stream-based television, as forecast by SMPTE/EBU Joint Task Force. Conceived idea of Dynamic Documents™ to permit efficient extensions of standards without requiring lengthy processing so as to speed up the development of standards.

SMPTE/EBU Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams

Co-chairman, 1996 (inception) to 1998 (completion);

The Task Force, which was jointly established by SMPTE and the European Broadcasting Union (EBU), and included members from the Association of Radio Industries and Businesses of Japan (ARIB), had the goal of setting the worldwide direction for the transition in production, post production, and broadcasting from raster-based to bit-stream-based television. It rationalized the convergence of television, computers, and communications with the aim of providing direction to the development of standards for the next 1-2 decades. The Task Force included 200 experts from four continents, meeting 18 times over about two years, to produce two thorough reports. Initial report on "User Requirements" was released in April, 1997, and published in SMPTE Journal of June, 1997. Final report of "Analyses and Results" was released in September, 1998, and published in SMPTE Journal of the same month.

SMPTE Registration Authority Ad Hoc Group (AHG)

Chairman, 1997 (inception) to present;

AHG has responsibility for development of numerous registration functions required to support future digital television system functionality, including devising new types of standards documents called Dynamic Documents™, setting up major Internet registration data access capability, providing Registration Authority services for MPEG-2 private data types, providing Registration Authority services for ATSC Program, Event, and Version Identifiers (as per ATSC A/57), and the like.

SMPTE Committee on Television Systems Technology (S22)

Chairman, 2000 through 2001;

Committee has general responsibility for aspects of television technology that cross the boundaries of responsibility of the other SMPTE television technology committees and for understanding and managing the systems aspects of television. It therefore has responsibility for such matters as system timing references, time code, machine control, and system level messaging. It also has responsibility for systemization of major areas of development such as data and metadata flows through and between facilities.

SMPTE Committee on Registration and Identification Technology (R30)

Chairman, 2002 (inception) to present;

Committee has general responsibility for development of databases and processing methods to handle registration of identifiers and code points used in structured data systems. It manages the SMPTE Registration Authority and provides processing of requests for registration of those items for which processing is necessary. Its responsibilities extend to oversight of registration of MPEG-2 registration identifiers and general application of the Dynamic Documents™ concept.

ADVANCED TELEVISION SYSTEMS COMMITTEE

ATSC Technology Group on Distribution (T3)
Member, 1998 to present
The committee has responsibility for development of all ATSC standards, with numerous subgroups extant to deal with specific subjects. ATSC is the organization that develops the standards for the digital television broadcasting system adopted in North America and elsewhere in the world.

ATSC Specialist Group on Video (T3/S6)
Member, 1998 to present
Specialist group is responsible for development of ATSC standards related to processing and coding of video. It developed original standards for video and is working on extensions to the standards related to video.

ATSC Specialist Group on Data Multiplex and Transport (T3/S8)
Member, 1998 to present
The specialist group has responsibility for development of standards related to channel tuning, program guide information, conditional access, content protection and copy management, metadata, content identification, content advisories, and the like. In other words, it is responsible for work related to MPEG-2 Systems, including program-specific information and extensions thereto.
Chairman, Ad Hoc Group on Directed Channel Change (DCC), 1998 to present
AHG has documented a method for allowing broadcasters to cause receivers to present alternative streams of program content based upon selection criteria sent to receivers. This allows targeting program content and advertising to viewers for whom it is most appropriate.
Co-Chairman, Ad Hoc Group on Content Identification, 1999 to present
AHG is jointly developing with corresponding SMPTE AHG a method for unique identification of all forms of television content. This will allow automated tracking of programming and automation of television operations.
Member, Ad Hoc Group on Advanced EPG Metadata, 2000 to present
Member, Ad Hoc Group on Metadata Transport, 2001 to present
Member, Ad Hoc Group on Robust Transport, 2001 to present

ATSC Specialist Group on Radio Frequency Transmission (T3/S9)
Member, 2000 to present
Specialist group is developing enhancements to the 8-VSB transmission system that is used as the terrestrial broadcasting method for ATSC-defined signals.
Chairman, Ad Hoc Group on Distributed Transmission & SFNs, 2001 to present
AHG reviewed the Transmitter Synchronization Standard for Distributed Transmission (A/110) that is a personal contribution and that is based on personally-developed technology, for which a patent is pending. It also prepared a Proposed Recommended Practice on Synchronized Multiple Transmitter Networks (PRP/111) that explains implementation aspects of Digital On-Channel Repeaters (DOCRs), Distributed Transmission, and Distributed Translators.

ATSC Implementation Subcommittee (IS)

Member, 1998 to present

The committee reviews any and all matters related to the implementation of ATSC standards. Thus it is considering implementation of Directed Channel Change along with a variety of other aspects of digital television implementation.

Chairman, Ad Hoc Group on Directed Channel Change, 2001 to present

AHG is considering aspects of DCC that are not covered by the standard. Included are methods for broadcasting using DCC and design considerations for receivers that implement DCC.

Member, Systems Evaluation Working Group (SEWG), 2000 to present

SEWG examines all sorts of systems aspects of implementation of ATSC standards. This has included issues of latency of transmission and resulting differences in program emission timing, systems aspects of DCC, appropriate interfaces for carriage of various signals, methods for processing and transporting closed captions, and the like.

Member, Radio Frequency Working Group (RFWG), 2000 to present

RFWG has examined the planning factors used to determine coverage of digital television stations and found flaws in the methods used by earlier committees and the FCC. It is considering methods to improve the accuracy of prediction of signal coverage.

OTHER PROFESSIONAL ACTIVITIES

Video Services Forum, Inc.

Founder and Facilitator, 1998 (inception) through 2000;

The Video Services Forum is the principal organization of common carriers of television services over telephony and satellite networks, the manufacturers serving them, and the users of their services. It includes three sub-organizations: the Video Services Provider Forum, the Video Services Industry Forum, and the Video Services User Group. Services provided to the Forum as Facilitator included incorporating the organization, chairing all meetings including those of the Board of Directors, providing financial management, and supervising on-going development of industry technical and operations standards and practices. Also provided support for the annual VidTranS conference.

Society of Broadcast Engineers (SBE):

Member, 1968 to present;

Helped found Philadelphia chapter and was secretary;

Helped found Northern/Central New Jersey chapter, Certification Chairman, 1991-1996.

Institute of Electrical and Electronics Engineers (IEEE)

Member, 1991 to present.

Society of Cable Telecommunications Engineers (SCTE)

Member, 1993 to present.

Member, Digital Video Subcommittee (DVS), 1996 to present.

Northern California Frequency Coordinating Committee (NCFCC):

Founder in 1978; Chairman, 1978 to 1984.

PAPERS AND PUBLICATIONS:

S. M. Weiss, "Machine Control at KPIX: Cornerstone to Digital," Broadcast Management/Engineering (BM/E), Feb., 1981, pp. 51-59.

S. M. Weiss & R. Marconi, "Putting Together the SMPTE Demonstrations of Component Coded Digital Video, San Francisco, 1981," SMPTE Journal, Oct., 1981, pp. 926-938.

S. M. Weiss, "The Transition from Analog to Digital – A Scenario," 123rd SMPTE Technical Conference, October 30, 1981, #138.

S. M. Weiss & R. Lorentzen, "How Teletext Can Deliver More Service and Profits," Broadcast Communications, Aug., 1982, pp. 54-60.

S. M. Weiss, "Small Format Video Recorders – A Systems Perspective," 124th SMPTE Technical Conference, November 8, 1982, #11.

S. M. Weiss, "Rolling Your Own – Customized Microcomputers for Custom Applications," 17th SMPTE Television Conference, February 5, 1983, #34.

S. M. Weiss, "A Progress Report from the Working Group on Component Analog Video Standards," 125th SMPTE Technical Conference, November 3, 1983, #80.

S. M. Weiss, "Component Analog Video Standards – A Progress Report," 10th International Broadcasting Convention (IBC), September 22, 1984.

S. M. Weiss, "Working Group Report and Test Results on S-MAC for the Studio," 126th SMPTE Technical Conference, November 1, 1984, #67.

S. M. Weiss, "In the Beginning, There Were Red, Green, and Blue ... A Tutorial on Component Video and a Working Group Progress Report," 19th SMPTE Television Conference, February 15, 1985, #8.

S. M. Weiss, "S-MAC: Proposed SMPTE Studio Component Video Distribution System," National Association of Broadcasters (NAB) Convention, April 15, 1985.

S. M. Weiss & S. N. Baron, "Components at a Crossroads: Making the Right Choices," 127th SMPTE Technical Conference, October 30, 1985.

S. M. Weiss, "Trouble in Transition City: NTSC Setup in a Component Environment," 127th SMPTE Technical Conference, October 31, 1985.

S. M. Weiss, "Component Video – Where Are We Going?" National Association of Broadcasters (NAB) Convention, April 14, 1986.

S. M. Weiss, "Practical Considerations in Implementing Component Video Systems," 11th International Broadcasting Convention (IBC), September 23, 1986.

S. M. Weiss, "Implementing Component Video Systems: Avoiding the Pitfalls," 128th SMPTE Technical Conference, October 29, 1986.

S. M. Weiss, "Extending Current Digital Video Standards to 10 Bits and Beyond," 129th SMPTE Technical Conference, November 2, 1987, #59.

S. M. Weiss, "Migrating to Advanced Television in the United States," 12th International Broadcasting Convention (IBC), September 27, 1988.

S. M. Weiss & K. H. Powers, "NTSC Compatible Advanced Television System and Implications for Studio Standards," Better Video Images, SMPTE, White Plains, NY, pp. 254-266; also presented at 23rd SMPTE Television Conference, February 4, 1989.

S. M. Weiss, "Evolutionary Approaches to Advanced Television – Making the Migration Possible," Better Video Images, SMPTE, White Plains, NY, pp. 361-375; also presented at 23rd SMPTE Television Conference, February 4, 1989.

S. M. Weiss, "Selecting Appropriate HDTV Production Standards for North America: Making the Puzzle Pieces Fit," 131st SMPTE Technical Conference, October 22, 1989.

K. H. Powers & S. M. Weiss, "QDA – The Progressive-Scan Alternative for High Definition Electronic Production Standards," Television – Merging Multiple Technologies, SMPTE, White Plains, NY, pp. 340-349; also presented at 24th SMPTE Television Conference, January 27, 1990.

S. M. Weiss, "Widescreen 525 – An Economical Entry into Advanced Television," National Association of Broadcasters (NAB) Convention, April 1, 1990.

S. M. Weiss, "Rolling Out Advanced Television in the United States," HDTV'90 Colloquium, Ottawa, June 28, 1990.

S. M. Weiss, "The Economics of HDTV for the Commercial Broadcaster," 3rd HDTV Update Conference, Association of Maximum Service Television, September 6, 1990.

S. M. Weiss, "Implementation Considerations for Simulcast HDTV Transmission at Local Television Stations," 40th IEEE Broadcast Technology Symposium, September 7, 1990.

S. M. Weiss, "The Technology of Widescreen 525: Behind the Economics," 132nd SMPTE Technical Conference, October 17, 1990, #133.

S. M. Weiss, "Advanced Television," monthly column in TV Technology magazine, beginning with issue of July, 1992, and continuing through May, 1997.

S. M. Weiss, "Advanced Television Implementation Studies in the FCC Advisory Commitee Process," Workshop on High Data-Rate Digital Broadcasting, Massachusetts Institute of Technology, October 26, 1992.

S. M. Weiss, "The 'New' NTSC Color Television Standard – SMPTE 170M," 134th SMPTE Technical Conference, November 9, 1992, #1.

S. M. Weiss, "Planning for Advanced Television in the United States," Advanced Broadcasting Systems of Canada, March 30, 1993.

S. M. Weiss & R. H. Stow, NAB 1993 Guide to HDTV Implementation Costs, National Association of Broadcasters, Washington, D.C., April, 1993.

S. M. Weiss, "Digital Video Compression, Wireless Cable, and Education," California Distance Learning Summit IV, The Alliance for Distance Education in California, April 27, 1993.

S. M. Weiss, "Budgeting for Initial Implementation of HDTV," Society of Broadcast Engineers Convention, October 1, 1993.

S. M. Weiss, "Digital Video Compression in Television Systems," All-day Tutorial on *Compression: Expectations and Realities*, SMPTE 1994 Advanced Television and Electronic Imaging Conference, February 3, 1994

S. M. Weiss, "Bits, Bytes, Packets, Headers, and Descriptors," National Association of Broadcasters Convention, March 24, 1994

S. M. Weiss, "The Transition to Digital Operation for Wireless Cable," Institute of Electrical and Electronics Engineers, Broadcast Technology Symposium, September 23, 1994.

S. M. Weiss, "The Transition to Digital Operation for Wireless Cable," Private Cable and Wireless Cable Conference, November 14, 1994.

S. M. Weiss, "Reasons and Methods for Characterizing the Wireless Cable Channel for Digital Transmission," Wireless Cable Association Engineering Symposium, February 5, 1995.

S. M. Weiss, "Switching Facilities in MPEG-2: Necessary But Not Sufficient," New Foundations for Video Technology, SMPTE, White Plains, NY, pp. 44-70; edited version in SMPTE Journal, December, 1995, pp. 788-802; also presented at SMPTE 1995 Advanced Television and Electronic Imaging Conference, February 10, 1995.

S. M. Weiss, D. Koo, & E. Leyvi, "A Method for In-Service Characterization of Television Channels," Institute of Electrical and Electronics Engineers, Broadcast Technology Symposium, September 22, 1995.

S. M. Weiss & S. D. Driscoll, "Wireless Cable Channel Characterization – Initial Results," Wireless Cable Association Engineering Symposium, February 4, 1996.

S. M. Weiss, Issues in Advanced Television Technology, Focal Press, Boston, April, 1996.

S. M. Weiss, "New Systems Opportunities for Digital Wireless Cable Operations," Wireless Cable Association Convention, July 10, 1996.

S. M. Weiss, "Rationale for Two-Way and Distributed Transmission Operations of Wireless Cable Systems," Wireless Cable Association Engineering Symposium, February 14, 1997.

S. M. Weiss, "The DTV Phase-In: Timelines and Implementation Issues," in Television Management Conference on "The Switch to DTV — Making It Work," National Association of Broadcasters Convention, April, 1997.

S. M. Weiss, "The Future of Video: A New Era of Broadcasting and Business Applications," Keynote Address for the Broadband Emerging Video Services Conference, May 21, 1997.

H. Schachlbauer, S. M. Weiss, et al, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams, Initial Report: User Requirements," SMPTE Journal, June, 1997.

S. M. Weiss, "Issues in Digital Subscriber System Selection — A Tutorial," Wireless Cable Association Engineering Symposium, November 17, 1997.

S. M. Weiss, "Digital Video Broadcasting and Film: Markets of Today and Tomorrow," Workshop on the Coming Digital Video Economy, University of Kansas, December 19, 1997.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Programme Material as Bit Streams — Overview," Institution of Electrical Engineers (IEE) (UK) Colloquium, December 5, 1997.

S. M. Weiss, "EBU/SMPTE Task Force for the Harmonized Standards for the Exchange of Programme Material as Bit Streams — Systems," Institution of Electrical Engineers (IEE) (UK) Colloquium, December 5, 1997.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Programme Material as Bit Streams — Overview," European Broadcasting Union Seminar "Networks in the Television Studio," January 28, 1998.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Programme Material as Bit Streams — Systems," European Broadcasting Union Seminar "Networks in the Television Studio," January 28, 1998.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams — Overview," SMPTE Advanced Motion Imaging Conference, "Migrating Toward a Networked Digital Future," February 5, 1998.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams — Overview," SMPTE Seminar "Charting the Course of Television Technology in the Coming Decades: From Rasters to Bit Streams" at National Association of Broadcasters Convention, April 4, 1998.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams — Systems," SMPTE Seminar "Charting the Course of Television Technology in the Coming Decades: From Rasters to Bit Streams" at National Association of Broadcasters Convention, April 4, 1998.

S. M. Weiss, "Developing Required Strategies for DTV Implementation," in Television Management Conference on "The Road to DTV – Part 1: Choosing the Right Operational Options," National Association of Broadcasters Convention, April 5, 1998.

S. M. Weiss, "Wireless Rebroadcast Issues for Digital TV and Cable," National Association of Broadcasters Convention, April 8, 1998.

S. M. Weiss, "Networking Considerations for Two-Way MMDS," Wireless Communications Association Convention, July 8, 1998.

H. Schachlbauer, S. M. Weiss, et al, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams, Final Report: Analyses and Results, July 1998," SMPTE Journal, September, 1998, pp. 605-815.

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A. Mattsson, S. M. Weiss, D, Hershberger, Y. Wu, M. Simon, & X. Wang, "Transmitter Identification Techniques for Distributed Transmission Networks," at IEEE Broadcast Technology Symposium, October 15, 2003.

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Approximately 75 other papers and presentations given to local chapters of SMPTE, SBE, STE, IEEE, plus NAB Convention, Video Expo, etc., on subjects of digital video, teletext, machine control, audio systems, plant timing, frequency coordination, Advanced Television, Advanced Compatible Television, High Definition Television (HDTV), Digital Video Compression, Digital Television (DTV), video as bit streams, and others. In addition have served as session chairman or panel moderator at six NAB Conventions, eight SMPTE Conferences, the EIA Digital Video Workshop, the International Broadcasting Convention (IBC), the Montreux International Television Symposium, and the Wireless Cable Association Convention.

PROOF OF SERVICE

I, Sylvia A. Berson, declare:

I am a citizen of the United States and employed in Los Angeles County, California. I am over the age of eighteen years and not a party to the within-entitled action. My business address is 601 South Figueroa Street, Suite 3300, Los Angeles, California 90017.

On **October 20, 2004**, I served a copy of the within document(s) described as **DECLARATION OF S. MERRILL WEISS IN SUPPORT OF ACACIA'S OPPOSITION TO MOTION FOR SUMMARY JUDGMENT** by transmitting via United States District Court for the Central District of California Electronic Case Filing Program the document(s) listed above by uploading the electronic files for each of the above listed document(s) on this date, addressed as set forth on the attached Service List.

The above-described document was also transmitted to the parties indicated below, by Federal Express only.

Chambers of the Honorable James Ware
Attn: Regarding Acacia Litigation
280 South First Street
San Jose, CA 95113
3 copies

I am readily familiar with Hennigan, Bennett & Dorman LLP's practice in its Los Angeles office for the collection and processing of mail with the United States Postal Service; pursuant to that practice, envelopes placed for collection at designated locations during designated hours are deposited with the United States Postal Service with first class postage thereon fully prepaid that same day in the ordinary course of business; and,

I am readily familiar with Hennigan, Bennett & Dorman LLP's practice in its Los Angeles office for the collection and processing of federal express with Federal Express.

I declare that I am employed in the office of a member of the bar of this Court at whose direction the service was made.

Executed on **October 20, 2004**, at Los Angeles, California.

/s/
Sylvia A. Berson

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